

X-Ray Modeling of η Carinae and WR140 from Hydrodynamic Simulations

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The colliding wind binary (CWB) systems η Carinae and WR140 provide unique laboratories for X-ray astrophysics. Their wind-wind collisions produce hard X-rays, which have been monitored extensively by several X-ray telescopes, such as RXTE and Chandra. To interpret these X-ray light curves and spectra, we apply 3D hydrodynamic simulations of the wind-wind collision using both smoothed particle hydrodynamics (SPH) and finite difference methods. We find isothermal simulations that account for the absorption of X-rays from an assumed point source of X-ray emission at the apex of the wind-collision shock cone can closely match the RXTE light curves of both η Carinae and WR140. We are now applying simulations with self-consistent energy balance and extended X-ray emission to model the observed X-ray spectra. We present these results and discuss efforts to understand the earlier recovery of η Carinae's RXTE light curve from the 2009 minimum.